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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/676,671	10/01/2003	Robert L. Goldsmith	647P003	8224

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EXAMINER
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MENON, KRISHNAN S

ART UNIT	PAPER NUMBER
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1723

DATE MAILED: 01/18/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/676,671	GOLDSMITH ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Krishnan S. Menon	1723	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 01 October 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5 and 9-16 is/are rejected.
- 7) ☒ Claim(s) 6-8 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

Claims 1-16 are pending as originally filed

### ***Double Patenting***

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1, 4 and 16 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 12 and 13 of copending Application, No. 10/853,976. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims of the '976 application are for an apparatus having the device claimed in the present application. The device claimed in both the present application and '976 have limitations of the

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semipermeable membrane including microfiltration, ultrafiltration, etc., making the claims of the present application obvious over that of the '976 application.

Claims 1-3 and 16 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over Claims 1-7 of copending Application, No. 10/698,267. Although the conflicting claims are not identical, they are not patentably distinct from each other because claims of both applications recite similar structural elements, the differences in the limitations are only of intended use, the '267 application reciting passing a sweep fluid through the permeate in place of the recirculation of the permeate in the instant claims.

These are provisional obviousness-type double patenting rejections because the conflicting claims have not in fact been patented.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 1-4, 10, 16 are rejected under 35 U.S.C. 102(b) as being anticipated by Rainik et al (US 6,077,436).

Claims 1 and 16: Rainik teaches a cross-flow membrane device (see figures) having a ceramic monolith support (column 3 lines 55-60), plurality of longitudinal passages for feed and permeate (column 4 lines 1-10), a membrane coated on the feed

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side walls (column 6 lines 14-25), permeate conduits in the monolith (see figures, column 4 lines 1-17), and means for permeate introduction, withdrawal and recirculation (the parallel set of channels are for feed and permeate as in column 4 lines 39-47 and column 5 lines 30-48; membrane processes such as gas separation and pervaporation often require sweep gas or recirculation of the permeate-side gas for reducing the partial pressure or vapor pressure of the permeate: "the egress conduits can be equipped with means for providing second gas or liquid ... can be sweep gas ...; column 6 lines 38-43). The means-plus-function language in claim would invoke 35 USC 112, sixth paragraph, and accordingly, the claimed means would be what is specified or equivalents thereof. Applicant's specification page 6 middle paragraph describes such means as "... simple modifications to the monolith structure and installing the membrane devices within housings with simple connections for permeate flow circulation ...". Such provisions of housing and connections would be implied in the teaching of Rajnik. "[I]n considering the disclosure of a reference, it is proper to take into account not only specific teachings of the reference but also the inferences which one skilled in the art would reasonably be expected to draw therefrom." In re Preda, 401 F.2d 825, 826, 159 USPQ 342, 344 (CCPA 1968); In re Lamberti, 545 F.2d 747, 750, 192 USPQ 278, 280 (CCPA 1976). The driving force in claim 16 is also considered as "means plus function" limitation, the driving force recited in the specification being the recirculation of the permeate stream, or equivalent thereof; the use of sweep gas in the reference would be an equivalent. These limitations of recirculation or driving force are

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also intended use, which the teaching of the reference is capable of, and therefore, not patentable.

Claims 2 and 3: single monolith or monolith segments: column 4 lines 18-36

Claim 4: ultrafiltration or microfiltration – see column 5 lines 15-17.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-5, 9-14 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rajnik'436 in view of Goldsmith (US 4,781,831).

Claims 1, 14 and 16: Rajnik teaches a cross-flow membrane device (see figures) having a ceramic monolith support (column 3 lines 55-60), plurality of longitudinal passages for feed and permeate (column 4 lines 1-10), a membrane coated on the feed side walls (column 6 lines 14-25), permeate conduits in the monolith (see figures, column 4 lines 1-17), and means for permeate introduction, withdrawal and recirculation (the parallel set of channels are for feed and permeate as in column 4 lines 39-47 and column 5 lines 30-48; membrane processes such as gas separation and pervaporation often require sweep gas or recirculation of the permeate-side gas for reducing the partial pressure or vapor pressure of the permeate: "the egress conduits can be equipped with means for providing second gas or liquid ... can be sweep gas ...;

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column 6 lines 38-43). The means-plus-function language in claim would invoke 35 USC 112, sixth paragraph, and accordingly, the claimed means would be what is specified or equivalents thereof. Applicant's specification page 6 middle paragraph describes such means as "... simple modifications to the monolith structure and installing the membrane devices within housings with simple connections for permeate flow circulation ...". Such provisions of housing and connections would be implied in the teaching of Rajnik. "[I]n considering the disclosure of a reference, it is proper to take into account not only specific teachings of the reference but also the inferences which one skilled in the art would reasonably be expected to draw therefrom." In re Preda, 401 F.2d 825, 826, 159 USPQ 342, 344 (CCPA 1968); In re Lamberti, 545 F.2d 747, 750, 192 USPQ 278, 280 (CCPA 1976). The driving force in claim 16 is also considered as "means plus function" limitation, the driving force recited in the specification being the recirculation of the permeate stream, or equivalent thereof; the use of sweep gas in the reference would be an equivalent. These limitations of recirculation or driving force are also intended use, which the teaching of the reference is capable of, and therefore, not patentable.

Alternately, with respect to the housing and connections as in the instant claims, especially, claim 14, Goldsmith teaches a ceramic monolith membrane in a housing with inlet and outlet connections. It would be obvious to one of ordinary skill in the art at the time of invention to use the teaching of Goldsmith in the teaching of Rajnik because Goldsmith does not provide the details of how to make the device into usable form with the various connections, and one would use the teaching of Goldsmith because

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Goldsmith teaches providing low-pressure drop packing material as mechanical support for the filter and the filtrate conduits in assembly (see column 4 lines 32-36 and claim 18)

Claims 2 and 3: single monolith or monolith segments: column 4 lines 18-36

Claim 4: ultrafiltration or microfiltration – see column 5 lines 15-17.

Claim 5: annular space between the membrane device and the housing – see figures of the Goldsmith reference.

Claim 9: Means for permeate introduction and withdrawal are ducts: this is implicit in Rajnik in view of Goldsmith. In re Preda.

Claim 10: reduced area in permeate chambers – see column 4 lines 14-16.

Claims 11, 12, 13: area reduced during fabrication process: product by process limitation; it is immaterial for a product claim as to when the modification was done. “[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.” In re *Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). Filling the chambers with packing material, as in claim 13, is taught by Goldsmith – see column 4 lines 32-36.



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3. Claims 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rainik'436 in view of Goldsmith (US 4,781,831), with Vane et al (US 2004/0000521) as further evidence.

Rajnik in view of Goldsmith teaches the method of separating a feed stock as claimed. With respect to the circulation of a portion of the withdrawn permeate through the internal permeate conduits, applications such as gas separation and pervaporation require a driving force such as reduction in partial or vapor pressure in the permeate channels, which include circulation of a sweep gas, or recirculation of the permeate stream. Teaching of the use of the membrane device in the teaching of Rajnik in view of Goldsmith implies such sweep gas or permeate recirculation. For evidence, see Vane, which teaches recirculation of the permeate stream in pervaporation or membrane distillation process (abstract, figures and paragraphs 75 and 89).

#### ***Allowable Subject Matter***

Claims 6-8 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: The closest references, Goldsmith and Rajnik do not teach a flow resistance material filling the annular space between the membrane device and the housing. Even if Goldsmith teaches a filling material as support in the permeate conduits within the

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membrane device, there is no teaching or suggestion to extend this packing to the annular space between the membrane device and the housing.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Krishnan S. Menon whose telephone number is 571-272-1143. The examiner can normally be reached on 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wanda L. Walker can be reached on 571-272-1151. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Krishnan S. Menon  
Patent Examiner  
Jan 3, 2006.